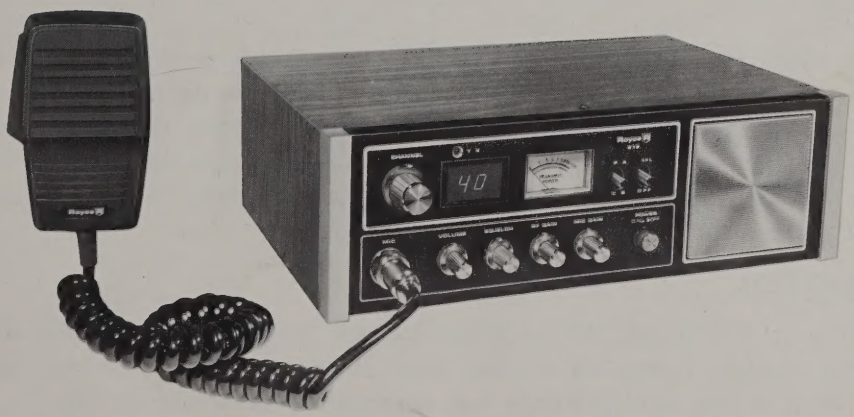
Royce
ELECTRONICS CORPORATION

Model 619

OWNER'S MANUAL

40-Channel AM Base Station
Citizensband
Transceiver



GENERAL

Your new Royce 619 is a professional quality 40 Channel AM Citizensband transceiver. It incorporates Royce's unique PLL oscillator system for accurate on-channel operation. It also incorporates several additional innovative engineering and user functions. Careful reading of the instruction manual before operation is essential for proper operation and prevention of damage.

PACKING

This unit has been especially protected for shipment. Open the carton carefully to avoid damage. Examine the unit for any visible damage. If the transceiver has been damaged in shipment, save the box and packing material and notify the transportation company.

DESCRIPTION

A. GENERAL

Your new 619 combines features and innovations for all-around versatility. The 619 will operate from 115 Volts AC (house current) or 12 Volts DC (positive or negative ground). The front mounted speaker projects sound forward for better clarity. A public address circuit allows you to convert the 619 into a paging system. Jacks are provided for external speakers and PA speakers.

B. RECEIVER

A tuned RF stage is employed to pull in even weak signals. The I.F. system is dual conversion and a ceramic filter is employed to reduce interference from adjacent channels. A RF Gain Control is provided to let you adjust the sensitivity level of the receiver. A Mic Gain Control lets you adjust modulation levels to maximize performance. A large meter monitors the incoming signal level. Other features include ANL, AGC, Volume, Squelch, and Transmit Indicator Light.

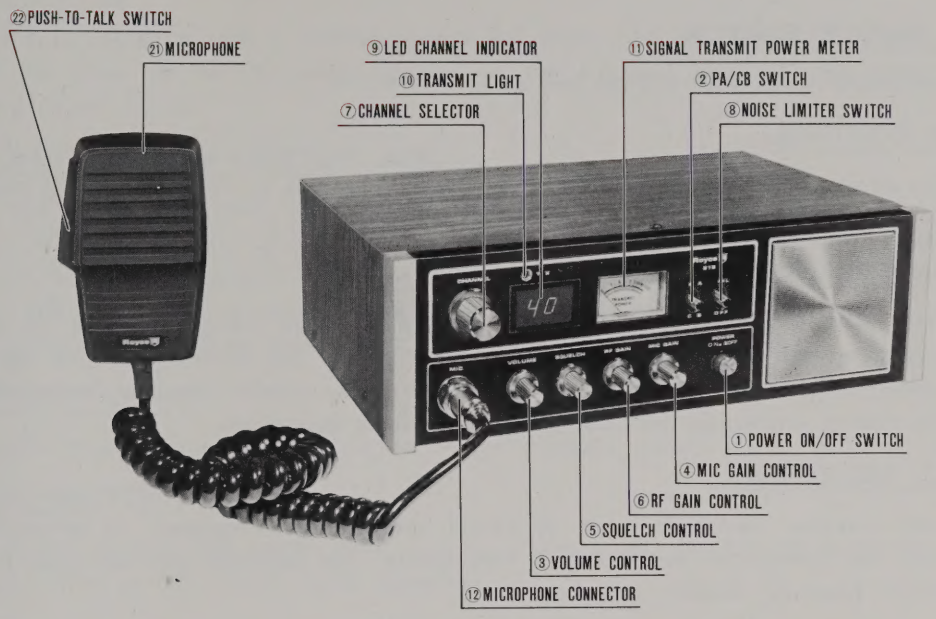
C. TRANSMITTER

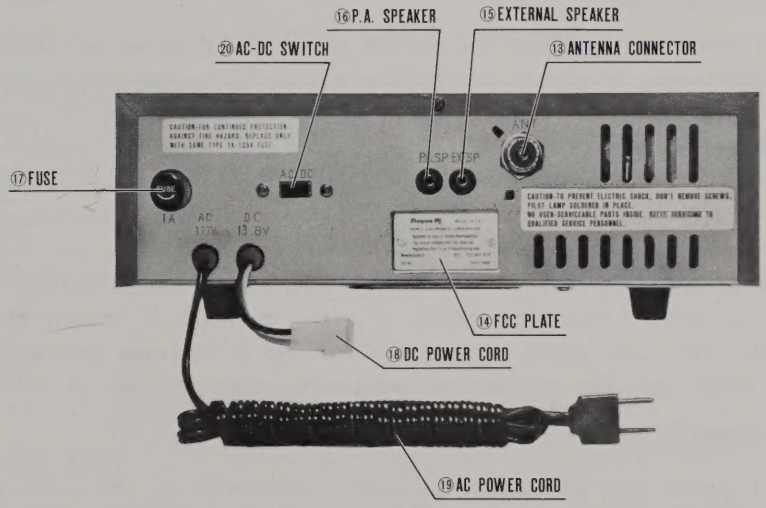
The heart of your 619 is the all new PLL oscillator. It provides full 40 channel operation from only two crystals. Integrated circuits plus other components replace the balance of crystals. PLL is the most accurate frequency system available for CB.

WARNING: TO PREVENT FIRE OR SHOCK HAZARD, DO NOT EXPOSE THIS APPLIANCE TO RAIN OR MOISTURE.

NOTE: The Model Number and Serial Number of your 619 are located on the metal plate riveted to the rear panel of the unit. Record and retain these numbers for your future reference. Model No. _____ Serial No. _____

OPERATION OF CONTROLS





FRONT VIEW:

1. POWER ON/OFF SWITCH
2. PA/CB SWITCH
3. VOLUME CONTROL
4. MIC GAIN CONTROL
5. SQUELCH CONTROL
6. RF GAIN CONTROL
7. CHANNEL SELECTOR
8. NOISE LIMITER SWITCH
9. LED CHANNEL INDICATOR
10. TRANSMIT LIGHT
11. SIGNAL TRANSMIT POWER METER
12. MICROPHONE CONNECTOR

REAR VIEW:

13. ANTENNA CONNECTOR
14. FCC PLATE
15. EXTERNAL SPEAKER
16. P. A. SPEAKER
17. FUSE
18. DC POWER CORD
19. AC POWER CORD
20. AC-DC SWITCH

MICROPHONE:

21. MICROPHONE
22. PUSH-TO-TALK SWITCH

FEATURES AND CONTROLS

POWER ON/OFF SWITCH

The switch simply turns your 619 on and off.

VOLUME CONTROL

This control adjusts the receiver volume. The control should be turned clockwise to increase the volume.

SQUELCH CONTROL

The Squelch Control is used to eliminate background noise when there are no signals present strong enough to overcome the noise. To adjust the Squelch Control, select a channel where there is no signal. Turn the volume up to normal listening levels. Rotate the squelch control clockwise until the background noise disappears.

CHANNEL SELECTOR

The channel selector switch is used to select the channel frequency. It automatically adjusts both the transmitter and receiver frequencies, and displays your selection in bold L. E. D. (Light Emitting Diodes) numerals.

MIC GAIN CONTROL

This control allows you to adjust microphone sensitivity or power to compensate for different operating situations. Maximum microphone sensitivity or power is obtained at the full clockwise position and the control should be set to this point for normal operation and maximum range. Examples of how this control can help to maximize communications effectiveness are as follows: When you are operating at extremely close proximity (within 100 yards or meters) of the other station, reducing the microphone gain may help to eliminate overload and distortion at the other station. When you are operating in an extremely noisy environment such as may be found in the cab of certain large trucks, open sports cars, or around noisy machinery, in order to avoid or reduce the amount of noise that goes out with your signal, you can reduce the microphone gain and by speaking more closely and loudly into the microphone, reduce the ratio of noise to voice.

RF GAIN CONTROL

This control allows you to adjust the basic sensitivity of the receiver section of the transceiver. It is somewhat like the microphone gain control in that it allows you to compensate for different or varying operation conditions. Maximum RF Gain or receiver sensitivity is obtained at the maximum clockwise position of this control, and the control should be set to this point for normal operating and maximum range. For example, when operating at close proximities to other strong signals, it may be helpful to reduce the RF Gain to avoid overload or distortion or interference from adjacent channels.

PA-CB SWITCH

When the PA/CB switch is placed in the PA position, it converts your 619 into a powerful Public Address System. The "PA" function requires an optional 8-16 ohm paging speaker (Royce 2-060). This speaker must be connected to the "PA" jack on the back of the set. Once this speaker has been connected, simply put the PA switch in the "PA" position

and depress the microphone Push-To-Talk switch to activate the set.

S/RF METER

The 619 is equipped with a combination S-RF Meter. In the receive position, the meter reads the level of the incoming signals. In the transmit position, the meter indicates relative power output.

AUTOMATIC NOISE LIMITER (ANL)

Your 619 is equipped with a sophisticated electronic noise eliminator system to greatly reduce extraneous noise coming into the receiver. In effect, noise pulses are clipped from incoming signals before they reach the amplification stage of the receiver. This causes no loss in the signal receive level. The ANL circuit should normally be left on. A switch has been provided to eliminate this circuit if desired.

TRANSMIT LIGHT

This light gives you a visual indication of the transmit mode.

AC-DC SWITCH

This switch selects the power input source. Turn to AC for 115 Volts-60 Hertz (house current). Put on DC for 12 Volts operation.

PA SPEAKER JACK

For attaching optional 8-16 ohm PA speaker. Use 3.5 MM jack.

EXTERNAL SPEAKER JACK

You may add any 8-16 ohm external speaker. Simply plug your accessory speaker into the jack. Inserting the 3.5mm plug will automatically disconnect the internal speaker.

DC POWER CORD

To attach unit to positive or negative ground 12 Volts source, a convenient quick disconnect is provided.

AC POWER CORD

To operate unit from 115 Volts AC-60 Hz (ordinary house current).

ANTENNA CONNECTOR

A standard SO-239 type connector is supplied for attaching either mobile or base antennas.

MICROPHONE

The receiver and transmitter are controlled by the press-to-talk switch on the microphone. To transmit, simply press in this switch. Release the switch to receive. When transmitting, hold the microphone three to four inches from your mouth and speak clearly at normal voice levels.

SPECIFICATIONS

GENERAL

1.	Semiconductors	: 22 transistors, 1 FET, 22 diodes, 3 integrated circuits
2.	Self-Containd Speaker	: 3 inch, 8 ohms voice coil
3.	Microphone	: Dynamic microphone with push-to-talk switch, 500 ohms
4.	Controls, Indicators and Connectors	: Volume control : Variable Mike Gain Control : Variable Squelch Control : Variable RF Gain Control : Power on-off Push Switch : Channel Selector : LED channel indicator : TX Light (RED) : Illuminated S/RF power meter : AC-DC Slide Switch : PA-CB Slide Switch : ANL ON-OFF Slide Switch : Coaxial type antenna connector : Microphone connector : DC Cord with connector : External Speaker Jack : Public Address Speaker Jack
5.	Power Supply	: 13.8 Volts DC (positive or negative ground) : AC 117V 50/60Hz
6.	Cabinet Description	: Vinyl Clad Steel
7.	Dimensions	: 7-7/16″(D)×11-7/16″(W)×4″(H)

RECEIVER

1.	Frequency Range (MHz)	: 26.965—27.405
2.	Sensitivity	: 0.5μV for 10 dB S+N/N
3.	Selectivity	: 5 KHz minimum at 6 dB down
4.	Adj. channel rejection	: More than 60 dB
5.	Audio power output	
	at 8 ohms	: More than 2.5 W at 10% distortion
	at 4 ohms	: More than 4 W at 10% distortion
6.	Audio fidelity (1KHz=0dB, 6dB down)	: 400Hz—2000Hz
7.	AGC figure of merit	: More than 80 dB
8.	Squelch Sensitivity (Threshold)	: Less than 0.5 μV
9.	Spurious Rejection	: More than 45 dB

TRANSMITTER

1.	Frequency Range (MHz)	: 26.965—27.405
2.	RF Power Output	: 4 W
3.	Modulation Capability	: More than 80%
4.	Squrious Suppression	: More than 60 dB
5.	Frequency Tolerance	: ± 0.005%

POWER SUPPLY

AC OPERATION:

Your Royce 619 is designed to operate from any 117 Volts AC, 60 Hertz (ordinary house current) outlet. Simply connect the AC power cord to any convenient house outlet.

DC OPERATION:

While it is highly unlikely that you will use your 619 in an automobile, you may desire to run it off a 12 Volt battery in case of emergencies. You can do this by attaching the DC cord to the set. Attach the red (fused) wire to the battery plus (+) terminal. Attach the black lead to the battery minus (—) terminal.

SHOULD YOU DESIRE TO OPERATE THE 619 IN YOUR VEHICLE, IT IS EQUIPPED TO OPERATE EITHER POSITIVE OR NEGATIVE GROUND. CAREFULLY FOLLOW THE INSTRUCTIONS BELOW.

NO MOBILE MOUNTING BRACKET IS SUPPLIED OR AVAILABLE.

NEGATIVE - POSITIVE GROUNDING:

Almost all cars and most trucks currently operating in the U. S. are negative ground. There are some large trucks and construction equipment which operate on positive ground. Your Royce 619 will operate on either. In the negative ground systems, the minus (—) pole of the battery is attached to the car body, engine block, etc.

NEGATIVE GROUND HOOKUP:

Attach the red (fused) wire to the fuse block terminal or any convenient plus (+) lead. Devices operated by the ignition key such as the radio, light etc. are best since when you turn the ignition off, the unit will be turned off. Attach the black lead to the car body via any convenient method.

NOTE: Many newer cars use plastic dash pieces. Make sure the screw or contact you choose is attached to the metal framework of the car.

POSITIVE GROUND HOOKUP:

In the event that you do have a positive ground vehicle, the following hookup must be made. Attach the red (fused) lead to the car body via any convenient screw, bolt etc. Attach the black lead to the terminal block or any convenient wire which goes to the minus (—) pole of the battery.

FAILURE TO MAKE THE PROPER CONNECTION COULD RESULT IN UNIT DAMAGE.

ANTENNA REQUIREMENT

This transceiver will operate with any standard 52 ohm ground-plane, vertical, mobile whip, long wire or other CB antenna. A standard SO-239 type connector is provided on the back panel for use with popular PL-259 antenna plug.

ANTENNA INSTALLATION

BASE STATION:

When the 619 is used as a base station, any Citizens Band beam, dipole, ground plane or vertical antenna may be used. A ground plane type will provide greater coverage and, since it is essentially non-directional, it is ideal in base station to mobile operation. From base station to base station, or point-to-point operation, a directional beam will give greater distance even under adverse condition. The range of the transceiver depends basically on the height of the antenna and, whenever possible, select the highest location within F. C. C. limits. (These limits are printed in the Part 95 F. C. C. regulations enclosed with this transceiver).

MOBILE ANTENNAS:

A vertical whip antenna is best suited for mobile use. A non-directional antenna must be used for best results in any case. The base loaded whip antenna will normally provide effective communications. For greater range and more reliable operation, a full quarter-wavewhip should be used. Either of these antennas use the metal car body as a ground plane and the shield of the base lead as well as the metal case of the transceiver should be grounded. A standard antenna connector (type SO-239) is provided on the transceiver for easy connection to a standard PL-259 cable termination.

MOBILE INSTALLATION

A location in the car or truck should be chosen carefully for convenience of operation and non-interference with normal driving functions. Mounting may be under the dash or instrument panel or any place a secure installation can be made. The 12-Volt cable may be connected to any convenient terminal, but preferably to the ignition switch to prevent unauthorized persons from operation of your unit. With this method, the unit will only operate when your key is turned on. Engine ignition interference should not be a problem, and vehicles equipped with standard broadcast radios will have enough suppression to eliminate ignition interference. If interference is present, any skilled auto radio repairman should be able to eliminate it for you.

OPERATING PROCEDURES

A. AC OPERATION

CAUTION: BEFORE OPERATING THIS TRANSCEIVER, YOU ARE REQUIRED BY LAW TO READ AND UNDERSTAND PART 95 OF THE FCC RULES AND REGULATIONS.

CHECK AND MAKE SURE THE PROPER CONNECTIONS HAVE BEEN MADE ON THE POWER CABLE, ANTENNA, AND MICROPHONE.

B. RECEIVER

a. Plug in microphone.
b. Turn the volume and squelch controls fully counter clockwise.
c. Turn the RF Gain and the MIC Gain fully clockwise.
d. Set Channel selector to desired channel.
e. Put AC-DC switch to the AC position.
f. Put ANL pushbutton switch to A.N.L. position.
g. Plug AC cord into any convenient house outlet.
h. Place On/Off pushbutton in "On" position and increase volume to desired level.
i. With no signal present, rotate Squelch control clockwise until the rushing noise disappears.

C. TRANSMITTER

WARNING: IT IS ILLEGAL TO OPERATE THE TRANSMITTER SECTION OF THIS TRANSCEIVER PRIOR TO RECEIVING A VALID STATION LICENSE AND CALL SIGN FROM THE FEDERAL COMMUNICATIONS COMMISSION.

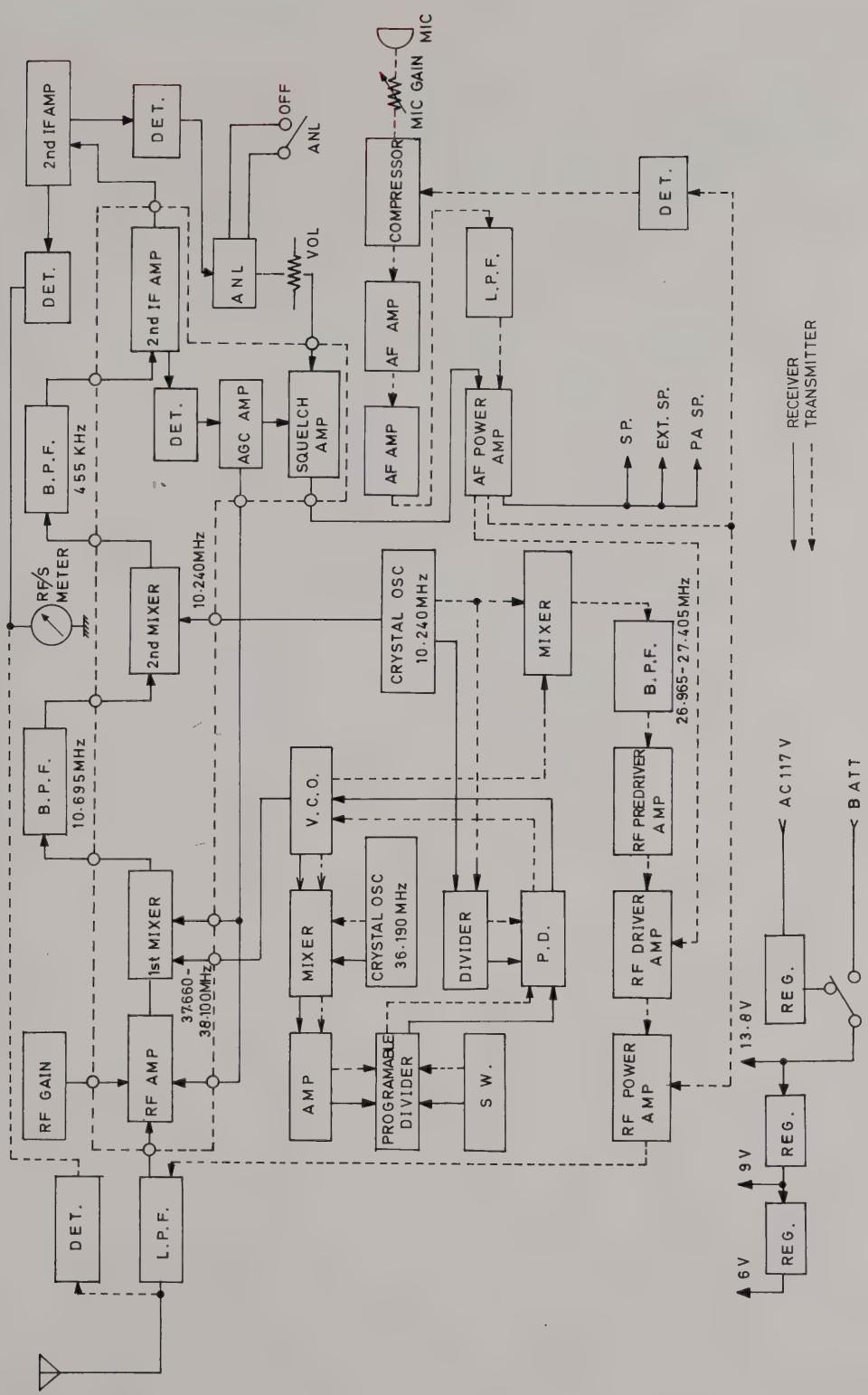
CAUTION: NEVER OPERATE YOUR 619 WITHOUT AN ADEQUATE ANTENNA SYSTEM OR LOAD. ANTENNA SWR SHOULD NOT EXCEED 3:1. FAILURE TO FOLLOW THESE RECOMMENDATIONS COULD RESULT IN UNIT DAMAGE.

a. Rotate the Channel selector to desired channel.
b. Depress the Push-To-Talk switch on the microphone. Hold the microphone 3 to 5 inches from your mouth and talk in a normal voice level.

D. DC OPERATION

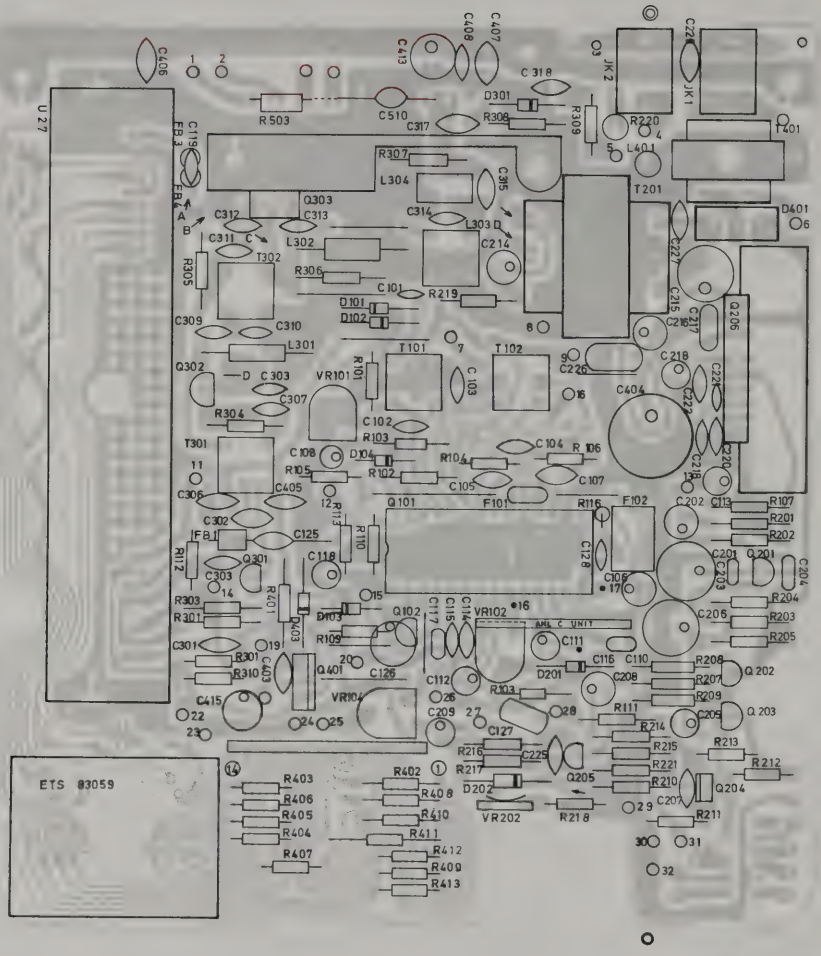
Follow all of the above except – put switch to DC position and attach DC cord to a 12 Volt source.

BLOCK DIAGRAM

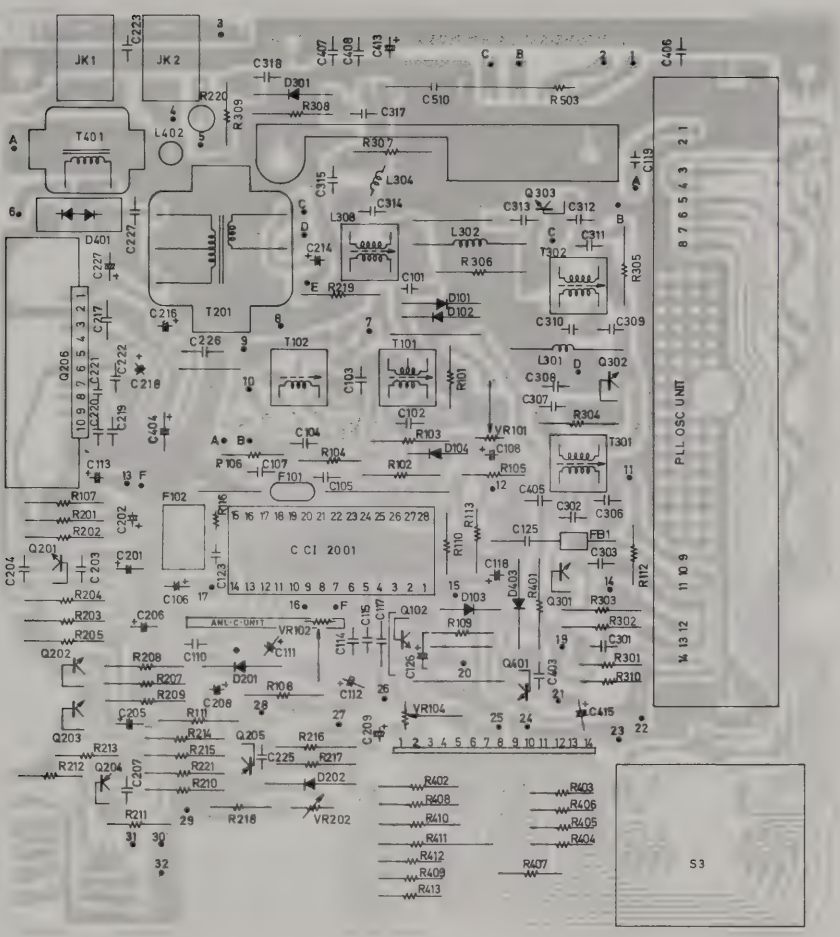


PARTS LAYOUT

TOP VIEW



BACK VIEW


JK1
JK2
T401
T201
T102
T101
L402
L304
L308
L302
T302
Q303
Q302
T301
D401
D301
D101
D102
D104
D103
D201
D202
VR101
VR102
VR104
VR202
F101
F102
C CI 2001
Q201
Q202
Q203
Q204
Q205
Q206
Q102
Q301
Q401
FB1
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R306
R305
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R303
R302
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R310
C510
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D501
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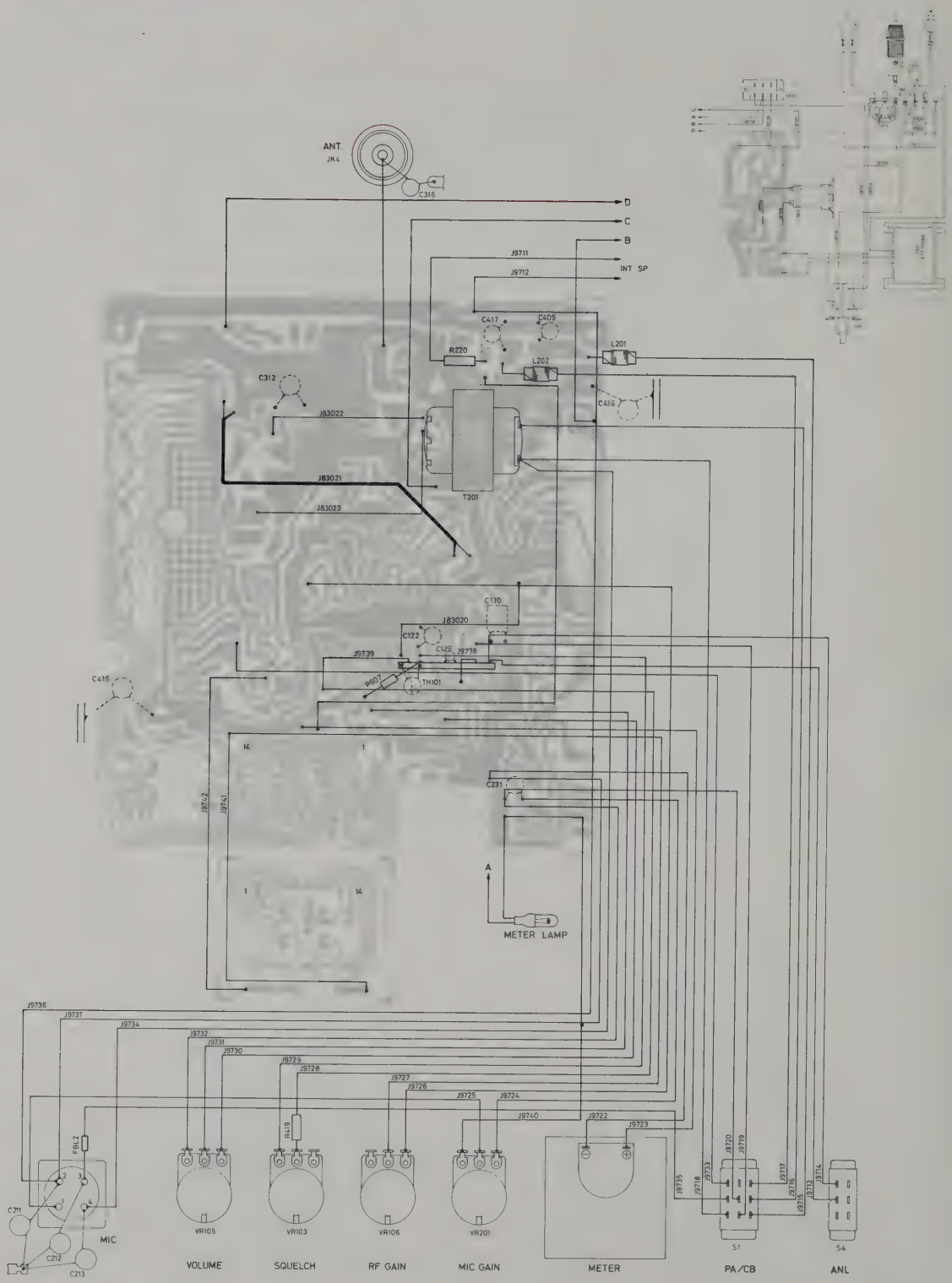
R508
VR501

WIRING DIAGRAM



ALIGNMENT INSTRUCTION

RECEIVER

A. Inject at the ant. jack a 27.185 MHz signal (±.001%; 30% modulation at 1 KHz).
B. Connect an audio voltmeter and oscilloscope across on 8 ohm load and plug into external speaker jack.

Test Equipment	Test Point	Adjust	Remarks
1. RF signal generator (low range to avoid audio saturation)	Inject at ant. jack	T-101, T-102, VR-101,	Max. output with vol. control at max, squelch control at min. output should be more than 500 mW (2.0 V/8 ohm) with gen. voltage at 1 μV; S+N/N more than 10 dB on all channels
2. RF signal generator	Inject at ant. jack	VR-104	Set the ant. input to 100 μV and the meter indication to 9 by VR-104
3. RF signal generator	Inject at ant. jack	VR-102	Set the volume control and the squelch control at maximum. and set the tight squelch by VR-102 so that the output from speaker is heard when the ant. input is increased up to 1,000 μV.

AGC RESPONSE

Set the output voltage of a signal generator at 50,000 μV and adjust the volume control so that the voltmeter output is 500 mW (2.0V/8 ohm). Then, lower the output voltage of the generator so that the voltmeter output is 10 dB down. The output voltage of the signal generator should be under 5 μV at this time.

AUDIO POWER CHECK

With a generator output of 1mV and squelch control at minimum, audio output should be more than 3.5 W (5.7 V/8 ohm) at maximum position of volume control.

TRANSMITTER

A. Power Supply — 13.8 VDC.
B. Use a suitable power meter, non-inductive dummy load and oscilloscope connected to antenna jack.

Test Equipment	Test Point	Adjust	Remarks
1. Power Meter	Antenna jack	T-301, T-302, L-303,	Adjust for maximum output power
2. Freq. Counter	Across dummy load	———	Check all channels ± 800 Hz
3. A.F. Oscillator with AF voltmeter in shunt (1KHz 30mV)	Inject at mic input	VR-202	—90% modulation oscilloscope
		———	Reduce AF oscillator output to 5 mV; modulation ≧ 50%

VOLTAGE ADJUSTMENT OF AC POWER SECTION

Set the output voltage of AC power section at 13.8 volts by adjusting VR-501.

VOLTAGE CHART

Q101 CCI 2001			
PIN NO	Tx	Rx	
1	0.3	6.4	
2	0.8	7.1	
3	0	0	
4	0.3	0.8	
5	0.3	3.6	
6	0	2.4	
7	0	1.7	
8	0	0	NO SQUELCH
	0.3	1.0	SQUELCH
9	0	6.4	NO SQUELCH
	0	2.9	SQUELCH
10	0	3.1	
11	0.3	2.9	
12	0	3.0	
13	0	3.5	
14	0	0.7	
15	0	0	
16	0	0	
17	0	3.5	
18	0	0.7	
19	0	0	

Q101 CCI 2001			
PIN NO	Tx	Rx	
20	0	4.5	
21	0	0.6	
22	0	4.2	
23	0	0	
24	0.2	0.7	
25	0.1	0.7	
26	0.3	1.8	
27	0	0	
28	0	5.6	

Q206 M51513L			
PIN NO	Tx	Rx	
1	6.4	6.5	
2	12.4	12.7	
3	10.6	10.9	
4	3.8	3.9	
5	3.0	3.0	
6	3.1	3.2	
7	1.9	1.9	
8	7.6	7.7	
9	1.3	1.3	
10	0	0	

		Vb (V)		Vc (V)		Ve (V)	
		Tx	Rx	Tx	Rx	Tx	Rx
Q102	2SD467	0.8	7.1	9.0	9.0	0.3	6.5
Q201	2SC458	3.9	10.6	12.6	12.7	3.3	10.4
Q202	2SC458	1.9	2.6	3.9	10.9	1.3	3.7
Q203	2SC458	2.5	3.2	9.0	10.9	2.0	2.6
Q204	2SA844	5.7	6.9	2.5	3.1	6.3	7.6
Q205	2SB561	0	0	0	0	0	0
Q301	2SC1908	2.9	3.3	12.7	12.7	2.2	8.9
Q302	2SC2086	0.2	0	12.3	13.4	0	0
Q303	2SC2166	0.2	0	12.3	13.4	0.1	0
Q401	2SC1173	9.6	9.5	12.6	12.8	8.9	8.9
Q601	2SC458	0	2.0	0	6.6	0	1.65

		Vb (V)		Vc (V)		Ve (V)	
		Tx	Rx	Tx	Rx	Tx	Rx
Q501	2SC458	8.4	8.4	15.1	15.1	9.0	9.0
Q502	2SD526	14.5	14.5	19.8	21.7	13.8	13.8
Q503	2SC735	15.1	15.1	19.8	21.7	14.5	14.5

YOU AND YOUR ANTENNA

Three main components comprise a typical Citizensband installation. They are: your transceiver, an antenna, and the coaxial cable which connects the antenna to the transceiver. It is important that all three pieces are installed correctly to give the best possible range and reliable performance. We hope this information will be helpful for you to realize the maximum performance of your installation.

ANTENNA

For several reasons, it is impossible to exactly PRE-TUNE an antenna at the factory. A general range of tuning is done which may suffice, but for best performance, an antenna should be tuned after it is installed.

Most antennas have some form of tuning capability. Usually, this involves the whip section sliding into a coil, spring, or metal section. This allows the antenna to be adjusted to the exact frequency desired. All Royce antennas are the "broad band" type. When adjusted for Channel 20, they will perform well from Channels 1-40. An untuned antenna robs you of range and could cause, after a period of time, substantial deterioration of the performance of an RF output transistor. We cannot stress enough the importance of tuning your antenna. The measure of an antenna's performance is its "SWR" (standing wave ratio).

COAXIAL CABLE

Coaxial cable is used in all Citizensband installations. This cable transfers the power from your transceiver to the antenna. The output of your transceiver is 50-52 ohms. Your antenna is designed to be 50-52 ohms. For this reason, RG58/U or RG8/U cable is used because it also is 52 ohms and matches the antenna to the unit. The frequency of the antenna is very important in this area because a mis-tuned antenna can disrupt the system balance. If this balance is disrupted, standing waves are generated on the coaxial cable, which results in a loss of power in your transceiver.

UNDERSTANDING SWR (Standing Wave Ratio)

In theory, your transceiver has a 50 ohm output and your antenna is 50 ohms. If a 50 ohm cable (such as RG58/U or RG8/U) is used, all the power from your transceiver will be transmitted via the coaxial cable and radiated by the antenna. Under these conditions, the SWR (standing wave ratio) of your antenna system would be 1 : 1. In practice, the antenna must be 50 ohms and tuned to the exact channel. This condition seldom exists and standing waves are set up on the cable. This SWR robs you of power and likewise range. While 1 : 1 is not always possible to attain, you should tune your antenna system so the SWR does not exceed 1.5 to 1 or at maximum 2 to 1. Here are some examples of the power losses for various SWR ratios:

SWR		Power Losses
1 : 1	=	0 %
1.3 : 1	=	2 %
1.5 : 1	=	3 %
1.7 : 1	=	6 %
2 : 1	=	11 %
3 : 1	=	25 %
4 : 1	=	38 %
5 : 1	=	48 %
6 : 1	=	55 %
10 : 1	=	70 %

TUNING YOUR ANTENNA

For optimum performance, an SWR meter should be used to tune the antenna. However, since this meter may cost from $15.00 to $30.00, not everyone may want to invest in its purchase. If possible, borrow one. If you are unable to borrow one, the RF output meter on your transceiver can be used as a GUIDE to antenna tuning. While it is not 100% accurate, it is generally better than no tuning at all. Always tune your antenna in an open area. Wires, metal and copper tubing if nearby can effect the tuning. Never tune an antenna inside a garage, under a metal car port, next to a metal truck, etc.

A. USING YOUR TRANSCEIVER OUTPUT METER AS A TUNING GUIDE

After installing your antenna system, place the whip halfway into its receptacle and turn your transceiver to Channel 20. Depress the switch on your transceiver microphone, and make note of the reading on your RF output meter. Loosen the adjustable whip section and move it 1/8 to 1/4 inch down. Again depress the transmit switch, if the reading is the same or lower continue moving the whip down 1/4 inch at a time until the LOWEST reading is obtained on your transceiver RF meter. If the reading was higher, move the whip up 1/4 to 1/2 inch the first time and 1/8 to 1/4 inch thereafter until the LOWEST reading is obtained on the RF meter. That's right..... THE LOWEST READING. Your RF output meter is a voltage sensing device. It is installed in the RF output circuit and senses the voltage near the antenna terminal. In a perfectly tuned system all of the voltage is transferred from the output transistor and passed to the antenna. As an example, let's use the figure 10. If there is SWR on the line, the forward voltage is 10 and a reverse voltage appears (let's say it's 2). The meter circuit now sees 20 and shows a higher reading. You can see that because of the way most RF output meters work, the LOWER your RF output meter reads the better your antenna is tuned. Of course, if the meter reads less than 1/2 scale, it may indicate a problem in your set and should be checked. Similarly, an extremely high reading may indicate a problem in your antenna. An RF output meter can tell you much.....especially if you know how to use it.

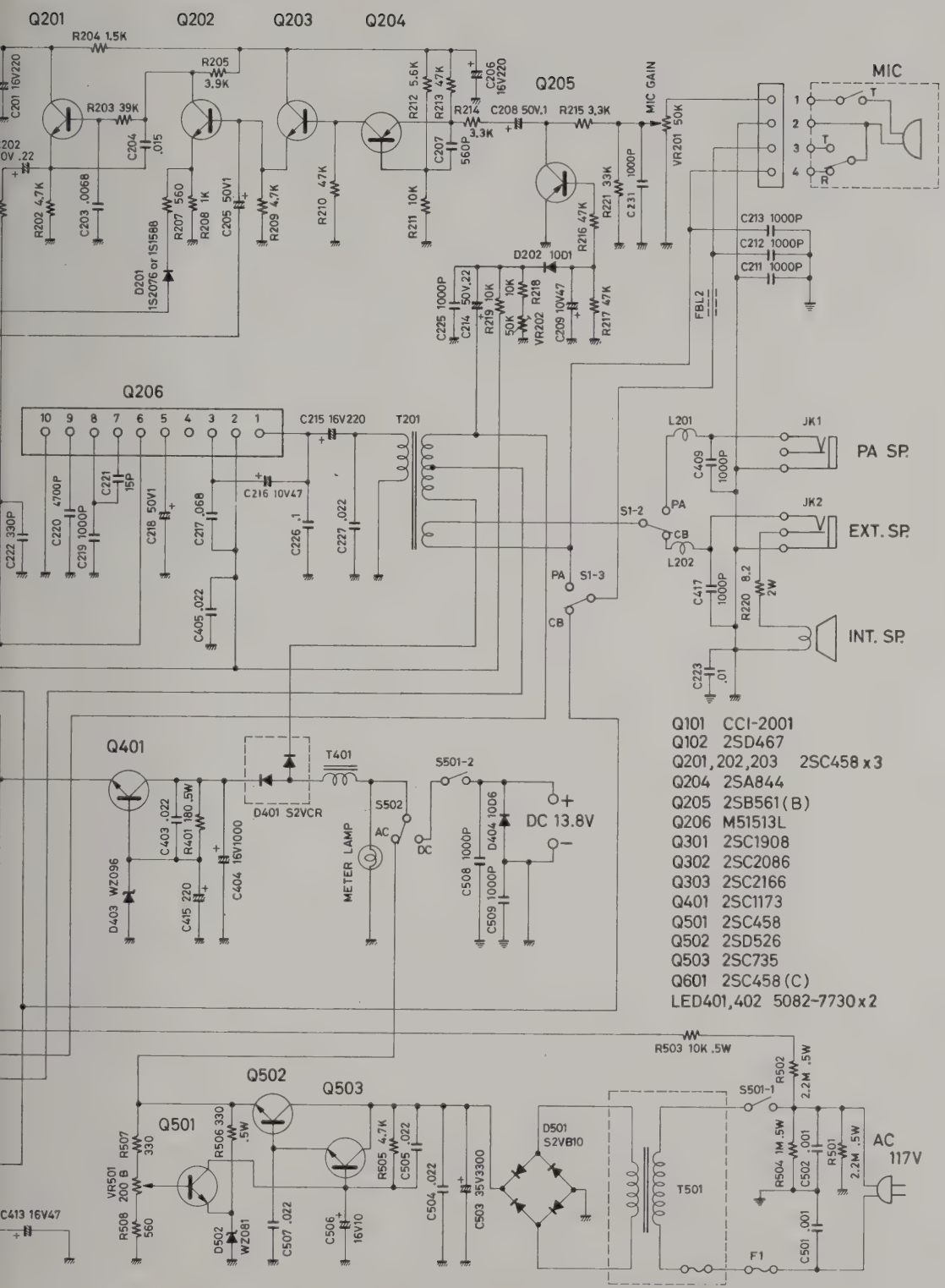
B. TUNING YOUR ANTENNA WITH AN SWR METER

Using an SWR meter is the most accurate way to tune an antenna.
Connect the SWR meter as close as possible to the back of the transceiver. Use a double male connector or a very short piece of RG58/U with connectors on each end.

Place the adjustable whip halfway into its receptacle. Set your transceiver to Channel 20. Measure the SWR following instructions supplied with the meter. After the first measurement, move the whip down 1/8 to 1/4 inch and repeat ALL the steps again. If the SWR is lower, continue the process moving the whip down 1/8 to 1/4 inch at a time until the lowest reading is obtained. If the SWR is higher, raise the whip 1/4 to 1/2 inch the first time and 1/8 to 1/4 inch thereafter until the lowest SWR is obtained. Note, if the reading continues falling but you have reached farthest point down that you can go with the whip, the whip may be too long. To verify this, put the Channel Dial to Channel 1 and measure the SWR. Next, put the channel dial to Channel 40 and measure the SWR. IF THE SWR WAS LOWEST ON CHANNEL 1 AND HIGHEST ON 40 THE WHIP SECTION IS TOO LONG. Carefully cut 1/4 to 3/8 inch from the whip section and re-measure Channels 1, 20, and 40. If the SWR is still lowest on Channel 1 continue trimming the whip by removing 1/8 to 1/4 inch at a time until the lowest SWR is obtained on Channel 20. DO NOT GET OVERANXIOUS. YOU CANNOT REPLACE A SECTION ONCE IT IS CUT OFF. If you exceed slightly the best tuning for Channel 20, the whip may be raised 1/8 to 1/4 inch at a time to obtain the best SWR on Channel 20.

WARNING: DO NOT CUT THE WHIP USING THE "POWER OUTPUT METER TUNING METHOD" YOU MUST USE AN SWR METER TO ACCURATELY DETERMINE THE SWR.

Every six months or so, re-check the SWR. Car washes, road grim, and chemicals can effect the mechanical connections of an antenna and corrode them. This corrosion can cause poor electrical connections and lead to high SWR. The correction of this problem is usually accomplished by cleaning of the metal connection parts with a wire brush.



Q101 CCI-2001
Q102 2SD467
Q201,202,203 2SC458 x3
Q204 2SA844
Q205 2SB561(B)
Q206 M51513L
Q301 2SC1908
Q302 2SC2086
Q303 2SC2166
Q401 2SC1173
Q501 2SC458
Q502 2SD526
Q503 2SC735
Q601 2SC458(C)
LED401,402 5082-7730 x2

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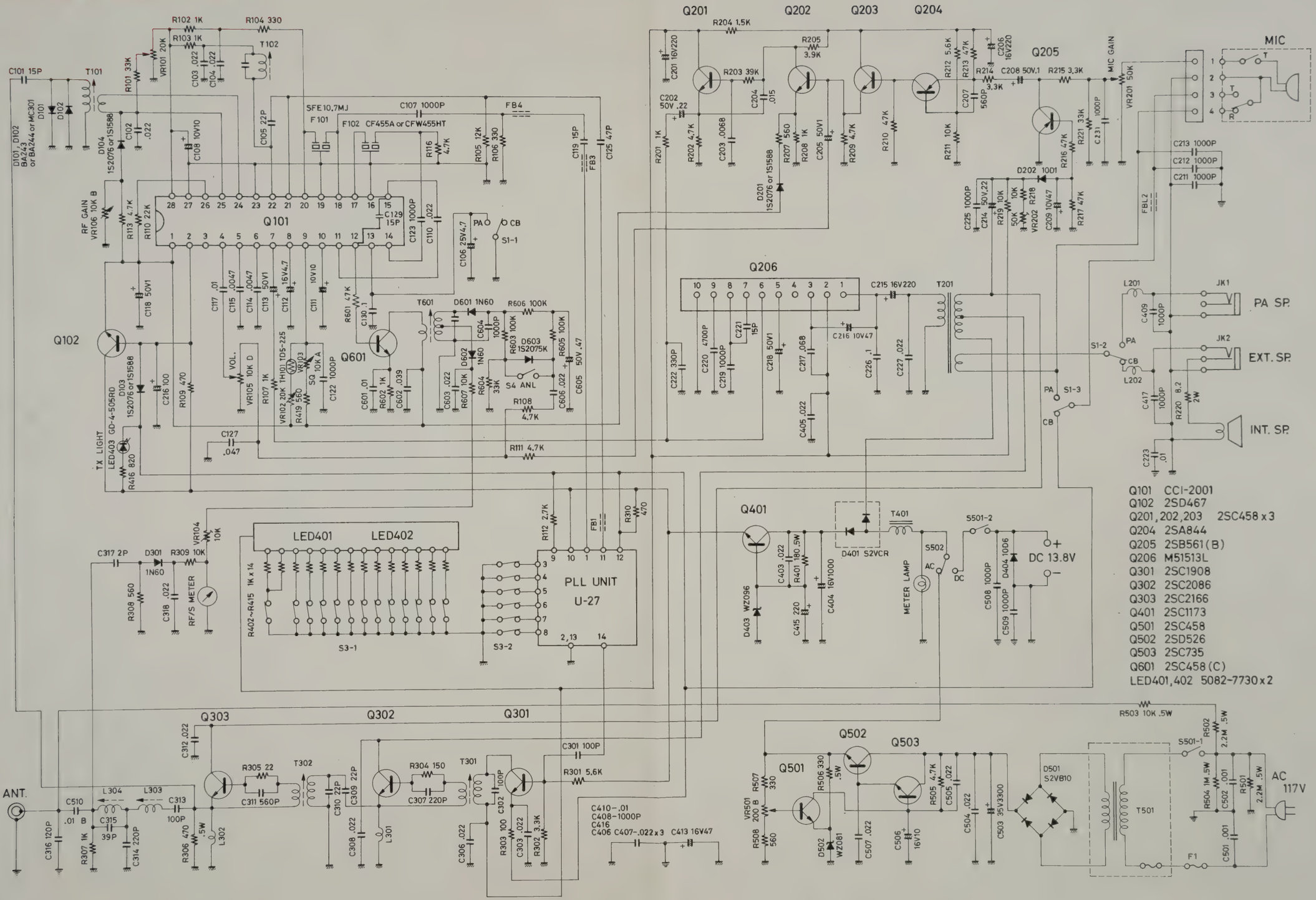
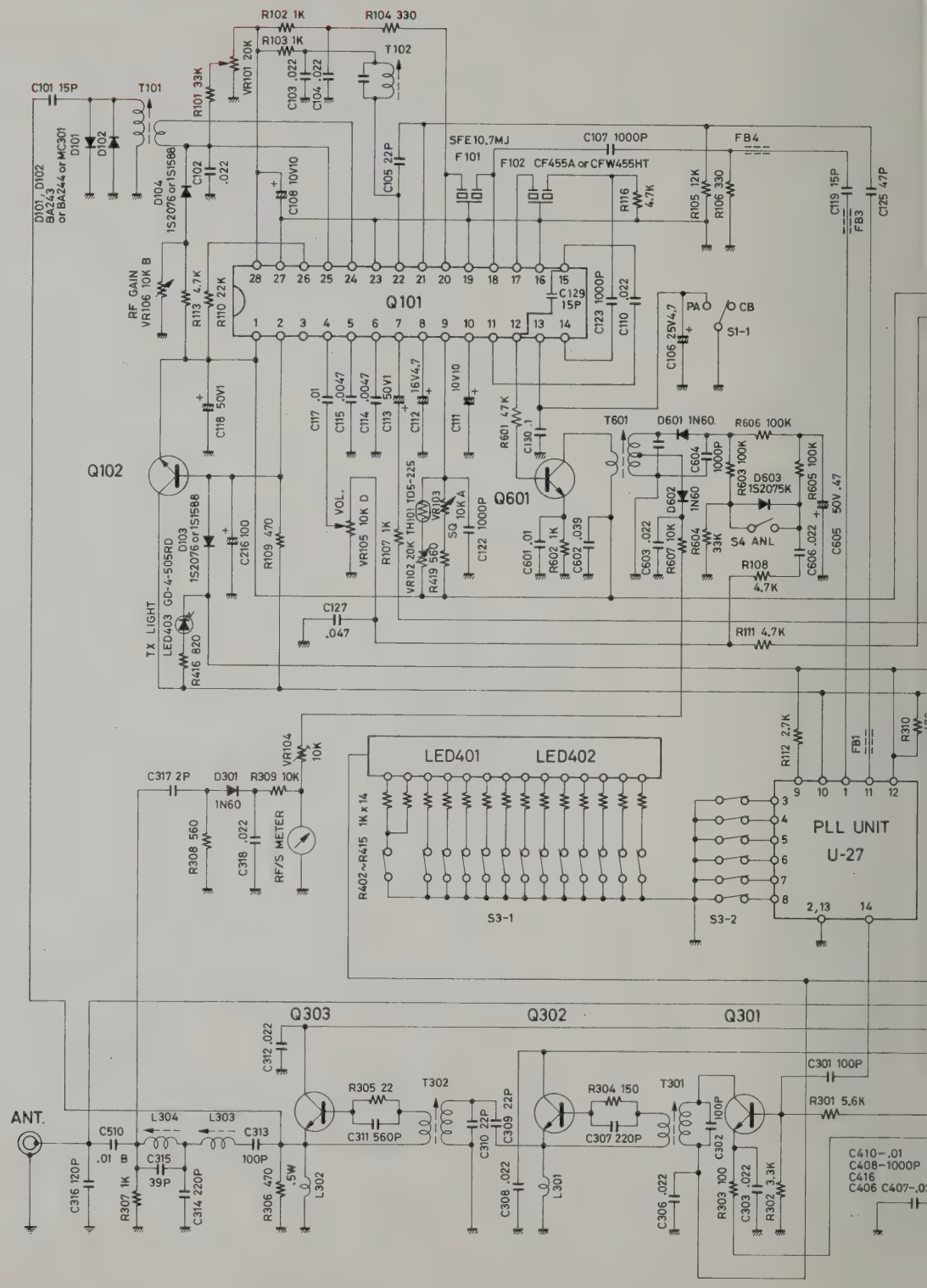
SCHEMATIC DIAGRAM



SCHEMATIC DIAGRAM



Ser. 1

HELPFUL HINTS

1. High SWR robs you of range and puts a strain on your output transistor. ALWAYS TUNE A NEW ANTENNA.
2. Never tune your antenna in a closed area (garage, under a metal car port, etc.) incorrect tuning may result.
3. MAKE SURE ALL MECHANICAL CONNECTIONS ARE TIGHT.
4. DON'T SMASH OR SHARPLY BEND THE COAXIAL CABLE—it should remain generally round to do its job properly.
5. TIGHTEN YOUR PL-259 CONNECTOR OCCASIONALLY—road vibration has a tendency to loosen it which can cause output transistor problems.
6. PERIODICALLY (every 6 months) re-check your SWR. Corrosion and road grime may rob you of performance.
7. PERIODICALLY check your coaxial cable for wear. A broken or loose wire could cause RF output transistor failure.

This information was produced to help you understand the installation and maintenance of your antenna and cable feed system. Many field problems have been traced to problems such as the above. They can lead to eventual failure of the RF output transistor in your transceiver. Careful installation and maintenance can prevent these problems.

TECHNICAL INFORMATION

FEDERAL COMMUNICATIONS COMMISSION REQUIREMENTS

The technical information, diagrams, and charts provided in this manual are supplied for the use of a qualified holder of a first or second class radiotelephone license in servicing this transceiver. It is the user's responsibility to see that this unit is operating at all times in accordance with the F. C. C. citizens radio service regulations.

If you install your own transceiver, do not attempt to make any transmitter tuning. Adjustments are prohibited by the F. C. C. unless you hold or are in the presence and under the supervision of a first or second class radiotelephone licensed person. A Citizens Band or Amateur license is not sufficient.

LIMITED WARRANTY

We warrant each new Royce product to the original consumer purchaser to be free from defects in material and workmanship for a period of ninety (90) days from date of purchase as shown on purchaser's receipt.

Royce will repair or replace, AT ITS OPTION AND FREE OF CHARGE, during the warranty period, any part which proves defective in material and/or workmanship under normal installation, use, and service. To obtain the name and address of a warranty service center in your area, just contact your local dealer listed in the telephone directory or return the unit to our factory, TRANSPORTATION CHARGES PREPAID, at the address below. THIS WARRANTY IS LIMITED TO DEFECTIVE PARTS REPAIR AND/OR REPLACEMENT ONLY AND DOES NOT COVER ANY ACCESSORY USED IN CONNECTION WITH THIS PRODUCT. LABOR CHARGES AND/OR DAMAGE INCURRED IN INSTALLATION, REPAIR, OR REPLACEMENT AS WELL AS INCIDENTAL AND CONSEQUENTIAL DAMAGES CONNECTED THEREWITH ARE EXCLUDED.

> Some states do not allow the exclusion or limitation of incidental or consequential damages, so the above limitation or exclusion may not apply to you.

Any damage to this product as a result of misuse, abuse, neglect, accident, incorrect wiring (not our own), improper installation, repair or alteration outside our factory or authorized service centers, or any use violative of instructions furnished by us, WILL VOID THIS WARRANTY.

This warranty gives you specific legal rights, and you may also have other rights which vary from state to state. In the event of a problem with warranty service or performance, you may be able to go to a small claims court, a state court, or a federal district court.

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